

QUESTIONABLE HELICOPTER...

THE PURPOSE OF THIS ACTIVITY IS TO CREATE DIFFERENT PAPER HELICOPTERS AND NOTICE SOME BASIC CHANGES IN THEIR FLIGHT PATTERNS BASED ON THEIR DESIGN.

PROCEDURE:

CUT OUT THE FIVE PAPER HELICOPTERS AND CUT ON THE **SOLID** LINES WITHIN EACH DESIGN.

FOLD THE FLAPS BACK ALONG THE **DOTTED** LINES.

FOLD THE BLADE ON THE RIGHT SIDE TOWARD YOU ON THE DOTTED LINE. FOLD THE BLADE ON THE LEFT SIDE AWAY FROM YOU ON THE DOTTED LINE.

ATTACH A PAPERCLIP AT THE BOTTOM OF EACH HELICOPTER.

DROP THE HELICOPTERS AND OBSERVE THE RATE AND DIRECTION OF SPIN FOR EACH ONE!!!

PROBLEM:

CHANGE YOUR HELICOPTERS SO THAT IT WILL ALWAYS SPIN CLOCKWISE. THEN, CHANGE THE HELICOPTER SO THAT IT WILL ALWAYS SPIN COUNTERCLOCKWISE!

ANSWER:

IF THE RIGHT BLADE OF THE HELICOPTER IS FOLDED FORWARD AND LEFT BLADE IS FOLDED BACKWARD, YOU WILL GET A COUNTERCLOCKWISE SPIN. REVERSING THE BLADES WILL GIVE A CLOCKWISE SPIN.

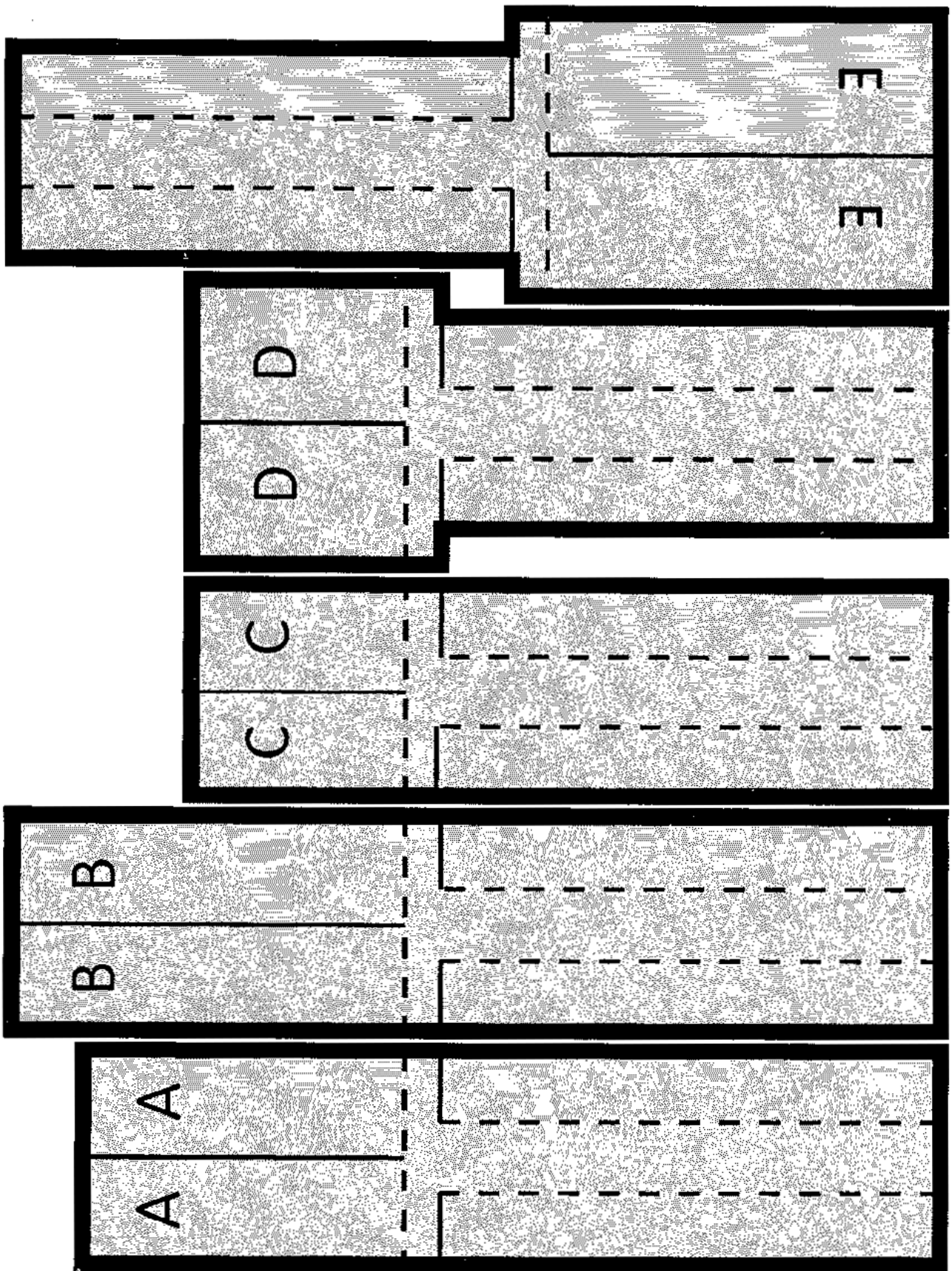
CHALLENGE:

CHALLENGE YOUR STUDENTS TO DETERMINE WHICH OF THE FIVE HELICOPTERS SPINS THE FASTEST/REACHES THE GROUND FIRST! THE HELICOPTER INVESTIGATIONS CHART WILL HELP YOU DETERMINE THE ANSWER!

AS GRAVITY PULLS YOUR PAPER HELICOPTER DOWN, AIR PUSHES UP AGAINST THE BLADES, BENDING THEM UP. BECAUSE THE BLADES ARE SLANTED SLIGHTLY, SOME OF THAT PUSH BECOMES A SIDEWAYS PUSH. AND BECAUSE YOU HAVE TWO BLADES THAT ARE POINTED IN OPPOSITE DIRECTIONS, THE TWO OPPOSING PUSHES OF AIR CAUSE THE HELICOPTER TO SPIN.

HELICOPTER INVESTIGATIONS

INVESTIGATION	CONTROLLED VARIABLE	INDEPENDENT VARIABLE	DEPENDENT VARIABLE
DROP MODELS A AND B	WIDTH OF BLADE	LENGTH OF BLADE	A SPINS MORE THAN B A REACHES THE GROUND BEFORE B
DROP MODELS A AND C	WIDTH OF BLADE	LENGTH OF BLADE	C SPINS MORE THAN A C REACHES THE GROUND BEFORE A
DROP MODELS B AND C	WIDTH OF BLADE	LENGTH OF BLADE	C SPINS MORE THAN B C REACHES THE GROUND BEFORE B
DROP MODELS C AND D	WIDTH OF BLADE	LENGTH OF BLADE	C SPINS MORE THAN D C REACHES THE GROUND BEFORE D
DROP MODELS D AND E	WIDTH OF BLADE	LENGTH OF BLADE	D SPINS MORE THAN E D REACHES THE GROUND BEFORE E
DROP MODEL A WITH BLADES FOLDED FIRST IN ONE DIRECTION AND THEN IN THE REVERSE DIRECTION	WIDTH AND LENGTH OF BLADE	DIRECTION THE BLADES ARE FOLDED	RIGHT BLADE FOLDED FORWARD AND LEFT FOLDED BACKWARD = COUNTERCLOCKWISE SPIN; RIGHT BLADE FOLDED BACKWARD AND LEFT FOLDED FORWARD = CLOCKWISE SPIN



Blades

Flaps

Cut on the solid lines and fold on the dotted lines. Fold the flaps back. Then fold one blade back. Attach a paper clip to the bottom of the flaps.